

Mechanistic Model for Atomization of Superheated Liquid Jet Fuel, Phase II

Completed Technology Project (2009 - 2013)



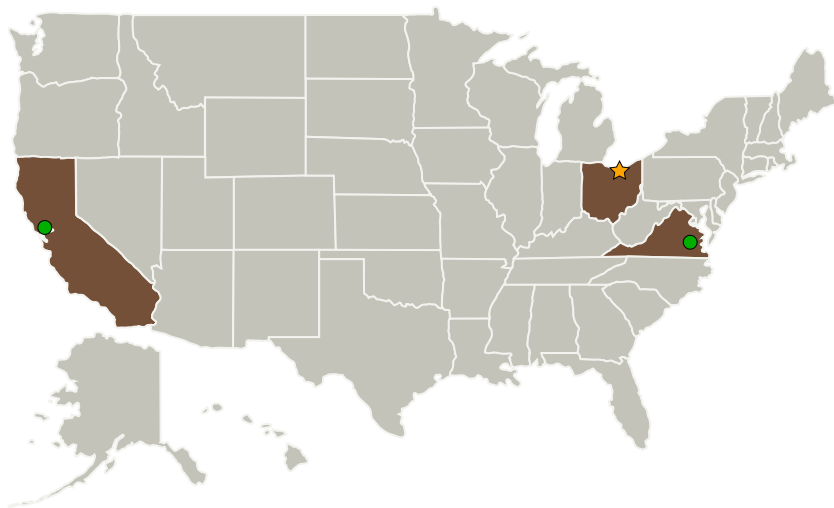
Project Introduction

As air-breathing combustion applications advance, increased use of fuel for cooling, combined with cycle advancements, leads to a situation where the fuel can become superheated. While this can lead to potential benefit in terms of the eventual fuel injection process, with enhanced atomization and evaporation, it creates a significant challenge relative design of a system to successfully exploit this behavior.

Anticipated Benefits

For Aerospace applications, development of fuel injection schemes that involve fuel superheat will be enhanced by model construction and validation resulting from the proposed project. Both standalone modeling tools and models for incorporation into a CFD environment will result from the project. NASA design tools will be enhanced in general and any simulation platforms needing to incorporate superheated fuel behavior will benefit in particular. Any application with fuel injection systems involving the potential for superheated liquid will benefit from the proposed work. Examples include automotive applications as well as boiler/furnace applications.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
● Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California
Energy Plus Ltd.	Supporting Organization	Industry	Laguna Hills, California
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Project Manager:

Gary C Jahns

Principal Investigator:

Vincent Mcdonell

Primary U.S. Work Locations

California	Ohio
Virginia	

Project Transitions

▶ **March 2009:** Project Start

✓ **August 2013:** Closed out

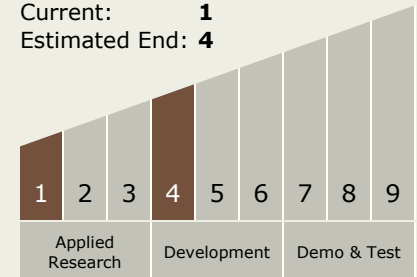
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Technology Maturity (TRL)

Start: **1**
Current: **1**
Estimated End: **4**



Technology Areas

Primary:

- TX01 Propulsion Systems
 - └ TX01.1 Chemical Space Propulsion
 - └ TX01.1.5 Hybrids